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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/709,483	11/13/2000	Oh-Nam Kwon	8733.307.00	4557

30827 7590 11/05/2002

MCKENNA LONG & ALDRIDGE LLP
1900 K STREET, NW
WASHINGTON, DC 20006

EXAMINER

PHAM, THANH V

ART UNIT PAPER NUMBER

2823

DATE MAILED: 11/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

09/709,483

Applicant(s)

KWON, OH-NAM

Examiner

Thanh V Pham

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/03/02 has been entered.

Specification

2. The disclosure is objected to because of the following informalities: the amended paragraph beginning on line 13 on page 2 with element "3" which could not be found in any figure.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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4. Claims 1-2 and 11 are rejected under 35 U.S.C. 102(a) as being anticipated by Havemann et al. U.S. Patent No. 5,891,804.

The Havemann et al. reference discloses a process for forming thin film conductors comprising forming a photoresist pattern 46 on a substrate 44/42/40/30/10; etching a portion of the substrate to form a groove 47 *beneath a top surface of the substrate* using the photoresist pattern as a mask; depositing a second metal 50 on the substrate, col. 2, lines 13-15, and a height of the second metal being smaller than a depth of the groove, fig. 3b; removing the photoresist pattern on the substrate and the second metal on the photoresist other than in the groove, fig. 3c; and forming the first metal 52 principally copper, col. 2, line 18, on the second metal in the groove, col. 4, lines 54-55, by electroless plating.

The step of electroless deposition inherently includes the step of preparing a mixed solution having a reductant and a first metal and submerging the substrate in the mixed solution.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claims 1-2, 4-5, 7-8, 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Havemann et al. as applied to claims 1-2 and 11 above, and further in view of Senda et al. U.S. Patent No. 5,364,459.

Re claims 1-2 and 11, the Havemann et al. reference discloses all of the limitation, it does not disclose Ag and Au and the kind of reductant used.

The Senda et al. reference discloses in the background of the invention that the first metal could be Cu, Ag or Au; the reductant could be formaldehyde; and "the electroless plating is not only applied to formation of a conductive film such as an electrode for an electronic component", col. 1, lines 10-35.

It would have been obvious to one of ordinary skill in the art to apply the known materials as stated by Senda et al. to the method of Havemann et al. because such materials would have been chosen for electroless plating process in the art of making electrode for an electronic device.

7. Claims 3, 6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Havemann et al. and Senda et al. as applied to claims 1-2, 4-5, 7-8 and 10-11 above, and further in view of Charneski et al. U.S. Patent No. 6,284,652 B1 and/or Eriksson U.S. Patent No. 3,632,435.

Both Havemann et al. and Senda et al. do not disclose the mixed solution for the electroless plating.

The Charneski et al. reference discloses sulfuric acid and cupric sulfate used in copper plating process. The Eriksson reference discloses the use of silver nitrate, gold

chloride with noble metal salts and hydroxide in the mixed solution for electroless plating.

It would have been obvious to one of ordinary skill in the art to apply the known materials as stated by Charneski et al. and/or Eriksson to the method of Havemann et al. and Senda et al. because such materials would have been chosen for the electroless plating process in the art of making electrode for an electronic device in the process of the combination of Havemann et al. and Senda et al.

8. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Havemann et al. and Senda et al. as applied to claims 1-2, 4-5, 7-8, 10 and 11 above, and further in view of JP 05-265040 and applicant's admitted prior art.

The Havemann et al. reference discloses a process for forming thin film conductors comprising forming a photoresist pattern on a substrate using electroless plating, the Senda et al. reference discloses formation of a conductive film such as an electrode for an electronic component using electroless plating.

None of the references disclose the further steps for forming the transistor.

However, JP 05-265040 (provided by applicant) discloses the steps of making gate line in a trench and the applicant admitted prior art that performing the further steps for forming the transistor.

It would have been obvious to one of ordinary skill in the art to apply the gate electrode of Senda et al. using the method of Havemann et al. into the JP 05-265040 reference of making a trench gate line and the applicant's admitted prior art of forming

transistor as the method and the analogous electrode would be selected in accordance with JP 05-265040 and the applicant's admitted prior art.

Response to Arguments

9. Applicant argues that layers 44/42/40/30/10, considered as a prepared substrate, is not a substrate by pointing to the Havemann et al. reference's col. 3, lines 29-38; therefore, the formed groove is not *beneath a top surface of the substrate*. However, because the term "substrate" is often used in the art of integrated circuit, it is often used to refer to the silicon, gallium arsenide or other wafer on which the integrated circuit is fabricated; at other time the term is used to refer to the incomplete portion of the integrated circuit on which a particular layer is formed; at still other times the word "substrate" is used to mean the immediate layer on which a material is formed, in this sense the term "substrate" is used broadly to mean any layer(s) on which a particular layer of interest is formed. Layers 44/42/40/30/10 is therefore considered as such and the groove 47 of Havemann et al. is formed *beneath a top surface of the substrate*.

10. The preliminary amendment filed 10/22/02 only amends the specification and claim 1 not the drawing as stated at the end line of page 4 and that amendment creates an objection as the second paragraph of this office action.

Conclusion


11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh V Pham whose telephone number is 703-308-2543. The examiner can normally be reached on M-T (6:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703-306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 (7724, 3431 and 3432) for regular communications and 703-308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

TvP
October 30, 2002


Olik Chaudhuri
Supervisory Patent Examiner
Technology Sector 2800